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ABSTRACT

The principal objective of this study was to develop a classification system for the elements of student and teacher evaluative dialogue which would account for (1) the content area--task centered versus peripheral, and open versus closed; (2) psychological tone--accepting versus rejecting, and neutral versus judging; (3) possibility for reflective thinking--long versus short, and repetitious versus singular; and (4) logical structure--"entry" versus "sustaining." The secondary objective was to determine what relationship may exist between patterns revealed by the classification system and (1) personality measures, (2) creative strategies, (3) predisposition for learning in art, and (4) learning in art as measured by strategy convergence. Twenty art education students participated in eight studio periods and 6 evaluative sessions, during which sessions, tapes were made which provided the primary source of data. The results of the testing of five hypotheses during the study show: (1) closed teachers use more "entries" than do open teachers; (2) "entries" or new teacher statements relate positively to aesthetic gains in art; (3) teacher open statements relate positively to gains in strategy; (4) there is no significant relationship between strategy of student or the teacher and any measure of verbal behavior used in the study; and (5) gains in aesthetic quality are positively related to the length of student statements and the percent of student talk. Data are presented in 26 tables. (DP)

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Cooperative Research Project No. S-050

Layman H. Jones Jr.

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CHAPTER I

INTRODUCTION

Problem

The development of evaluative ability is of primary importance in the arts. Because of the lack of definite standards the student must be able to establish meaningful standards for his own work in order to assess his own progress and to provide goals for future action. Therefore, the role of the teacher in helping a single student to develop his evaluative power is considered the most important area for the study of interaction.

Research at Penn State in which the principal researcher had participated, had attested to the importance of the teacher taking an active role during evaluative sessions. The same research also provided the structure of accounting for individual differences through strategies of creativity and a means for evaluating growth or learning by strategy convergence.

The basic problem of this study was to describe the verbal interactive patterns of student and teacher in a manner that will lead to an understanding of the effective verbal behavior of the art teacher in evaluative situations.

Objectives

The principal objective of this study was to develop a classification system for the elements of student and teacher evaluative dialogue which would account for (1) the content area--task centered versus peripheral, and open versus closed; (2) psychological tone--accepting versus rejecting,

and neutral versus judging; (3) possibility for reflective thinking--long versus short, and repetitious versus singular; and (4) logical structure--"entry" versus "sustaining." The secondary objective was to determine what relationship may exist between patterns revealed by the classification system and (1) personality measures, (2) creative strategies, (3) predisposition for learning in art and (4) learning in art as measured by strategy convergence.

Because of the exploratory nature of this study it should be stressed that its purpose is to develop as well as test hypotheses. Hypotheses suggested by initial examination of tapes were the following:

1. Teachers that are highly predisposed will use more "entries" than will teachers that are lower in art learning predisposition.
2. The use of more "entries" will relate positively to learning in art.
3. Teacher statements that are more open and task-centered will relate positively to learning in art.
4. When the teacher and student are of unlike strategies, the teacher will use more "entries" and they will be more open and task-centered.
5. Longer student responses will be positively related to learning in art. (It is thought that a longer response is evidence of more self-reflection.)

Related Research

As revealed in Table I the proposed study may be described as, (1) controlled, (2) related to personality, (3) related to personality

development as learning, (4) having a system of few categories, (5) concerned with content, (6) multi-dimensional, (7) involved with one teacher talking with one student, (8) striving for more empirical judgments, (9) concerned with only verbal behavior, (10) studying the statements of both teacher and student, (11) concerned with sequence of statements. Table I also shows that these qualities are in line with current trends in interactive studies.

Table II shows the source of the various elements of the proposed system of interactive analysis. One category found in many of the other systems is missing from the proposed system--procedural directions. The omission is the result of working with a highly structured situation in which the directions have already been given before the student meets with the teacher. It should be observed that the proposed study for the first time brings together the major concepts of previous systems of interactive study.

TABLE I

TRENDS IN INTERACTIVE STUDIES RELATED TO THE PRESENT STUDY

Study	Year	1		2		3		4		5		6		7		8		9		10		11	
		Normal classroom	Controlled situation	Unrelated to personality	Related to personality	Factual learning	Personality development	Many categories	Few categories	Social Climate	Content	Single dimension	Multi-dimension	Classroom	Individual with teacher	Inferential judgments	Empirical judgments	Total behavior	Verbal behavior	Teacher analyzed	Teacher and student analyzed	Statements treated individually	Concern for sequence
Anderson and Brewer (1)	1945	X		X		NS*		X		X		X		X		X		X			X	X	
Withall (14)	1949	X		X		X			X	X		X		X		X			X	X		X	
Bales (2)	1951		X	X		NS*			X	X		X			X		X		X	X		X	
Flanders (7)	1961	X			X		X		X	X		X		X		X			X		X		X
Bowers and Soar (5)	1961	X			X	X		X			X	X		X		X		X			X	X	
Mitzel and Medley (10)	1962		X	X		X		X			X	X		X		X		X			X	X	
Burkhart (6)	1962		X		X		X		X		X	X		X			X		X	X		X	
Lewis and Newell (8)	1962		X	X			X		X		X	X		X			X		X		X	X	
Smith and Meux (12)	1962	X			X		NS*	X			X	X		X			X		X		X		X
McCue Ashner (9)	1963	X			X	X			X		X	X		X		X			X		X	X	
Bellack and Davitz (4)	1963	X		X		X			X		X	X		X		X			X		X	X	
Solomon, Bedzak & Rosenberg (13)	1963	X			X	X			X		X	X		X		X		X			X	X	
Oliver and Shaver (11)	1963		X		X		X		X		X		X		X		X		X		X		X
PRESENT STUDY	1964		X		X		X		X		X		X		X		X		X		X		X

*Not Studied

TABLE II

SIMILAR TERMS FOUND IN THE PRESENT SYSTEM OF ANALYSIS AND IN RELATED SYSTEMS

	Structure		Content Area		Psychological Tone		Possibility for Self-Reflection	
	Entry	Sustaining	Task-Centered	Open Closed	Accepting Rejecting	Neutral Judging	Long Short	Singular Repetitious
Anderson and Brewer							Self Directive Dominative	
Withall							Learner supportive	
			Problem structuring	Directive	Accepting Reproving	Neutral		
Bales							Asks for suggestions	
			Neutral task area		Agrees Disagrees	Shows tension Tension release		
Flanders							Proportion of student talk	
			Lecture	Indirect influences	Giving praise Using student feelings constructively	Clarifying student ideas Justifying authority		
Mitzel and Medley (also used by Bowers and Soar)					Order seeking behavior		Teacher eliciting behavior	
	Introduces new activities Changes class activities Terminates activities		Evidence of planning Handles irrelevant questions at length		Threatens Agrees*	Polite Shouts		Reviews*
Burkhart				Divergent Factual	Absolute evaluation	Relative evaluation		

TABLE II

(continued)

	Structure	Content Area		Psychological Tone		Possibility for Self-Reflection	
	Entry Sustaining	Task-Centered Peripheral	Open Closed	Accepting Rejecting	Neutral Judging	Long Short	Singular Repetitious
Lewis and Newell						Sender oriented Receiver oriented	
Smith and Meux	Entry Sustaining	Defining Describing Designating Stating Reporting Explaining		Evaluating	Comparing Conditional inferring		
McCue Aschner		Convergent thinking		Evaluative thinking		Self structuring	
			Divergent associations Fact stating	Structured judgments	Unstructured qualified judgments		Recapitulation* Repetition* Recounting* Review*
Bellack and Davitz		Structuring		Reacting		Soliciting	
Solomon, Bedzak and Rosenberg		Teacher statements		Teacher feedback		Teacher questions	
		Obscurity	Permissive	Encouragement Non- encouragement	Practical Aggressive		
Oliver and Shaver		Discussion posture		Social emotional response		Statement posture	
		Substantive Analytic	Dialectical Descriptive	Support Antagonism	Tension Tension release Claims* Judgments*		Repeat*

*Item is under a different heading than was used by the author of that system.

CHAPTER II

PROCEDURES

Sample

The sample consisted of twenty students enrolled in an art education methods class during the fall of 1964. The students were predominantly female as is typical of undergraduate art education majors. The students were for the most part seniors who would be practice teaching during one of the next two terms. This period of their development represented a time when maximum experimental controls could be used on subjects approximating beginning teachers.

For the experiment the 20 subjects were assigned to 10 teams. In each team one person was to act as the student and one person was to act as the teacher. The students then drew from the same still life with identical materials - pen, brush, and ink on white paper. During the course of the 90 minute studio period the work of each student was photographed in process. Photographs were also made of the finished products at the end of the studio period. Before the next studio period each student met independently with his teacher for the purpose of evaluating his work (as revealed in the photographs) and setting up goals for the next studio period. During the evaluative session a tape recording was made of the dialogue. After four studio periods had alternated with three evaluative sessions the teacher and the student in each team exchanged roles and completed four more studio periods and three more evaluative sessions.

Data

The tapes made during the evaluative sessions were the primary source of data for this study. They were given to the principal investigator by Kenneth Beittel and Robert Burkhart who were responsible for the experiment just described. Their work was supported by U. S. Office of Education Cooperative Research Project No. 1874. As well as the tapes, which were a by-product of their study, Beittel and Burkhart also made available scores on the following personality measures and measurements of gains in art.

1. Measures of creativity - complexity, aestheticism, originality, independence, flexibility, and divergent questions.
2. Measures of predisposition for learning in art - theory, creative orientation, self-rating (process), word equations.
3. Measures of strategy gains in art as indicated by judgment of process photographs on criteria for spontaneity and criteria for divergency.
4. Measures of aesthetic gains in art as judged by spontaneous and divergent judges.[1]

These measures are all described in the final report of the study mentioned above. The development of measures for the tapes is the work of the present investigator and is reported in the following pages.

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[1]A slight variation of the method of Beittel and Burkhart was also employed. As well as judging each student's work against the work of the other students (resulting in a "Relative Aesthetic judgment"), internal aesthetic judgments were made which compared a single student's first works with his last works. Judgments were made on a scale of +5 (gains) to a -5 (loss). Judge agreement is slightly lower than for the relative aesthetic judgments because the strategy preferences of the judges seem to be more pronounced.

Method of Judging Tapes

The task of transcribing the tapes proved not only to be highly time consuming but also less objective than desirable for providing an object that was again to be judged. Objectivity was lost in the quality of the recordings themselves - they were made at 1 7/8 ft. per second and the subjects were untrained in speaking so that they would be recorded clearly. Many words were difficult to understand and to transcribe them was to exercise a subjective judgment. Objectivity was lost again through the use or lack of use of pronunciation. In either case emotional tone could not be judged objectively from typed scripts.

To make judgments while listening to the tapes not only required the development of new procedures but necessitated a new method of judging "entries." Smith (12) judged them by hindsight - a method that would be impossible while listening to the tapes. It was finally determined that the essential quality of an "entry" statement was that in relation to what had gone before it introduced something new for consideration. Newness could be judged while listening to the tapes.

The unit to be judged at one time was another major consideration. Many utterances were viewed as meaning only "I agree with you, keep talking." These expressions of interest or attention seldom interrupted the principal speaker's train of thought or his flow of words. Therefore it was determined to disregard these utterances and make judgments only when the possession of the "floor" definitely changed.

During judge training the final difficulties were worked out. The principal investigator operated the tape recorder and stopped it briefly when a judgment was to be made. It should be noted that this decision

was also a judgment but a judgment that could be immediately checked when the recorder was again turned on. On most tapes the judgment was easy to make but on a few tapes errors were made, necessitating backing up and replaying all of one unit for judgment. By recording the number on the footage indicator of the machine an objective measure of the length of each statement was also obtained. In a check for the ability to repeat the judgments on the size of the unit to be judged it was observed that in two successive tries the tape was stopped in exactly the same place 62 out of 64 tries. The percent of accuracy was therefore 97.

Discussion and judging trials by the principal investigator and three Doctoral candidates in art education resulted in the following names and definitions for the criteria to be judged.

Scale	Name (designates 3 on a 1 to 3 scale)	Definition
Entry to sustaining	New	Relationship of one statement to previous statements--new ideas not just new words.
Singular to Repetition	Repetition	Internal restatement of parts within a single statement.
Accepting to Rejecting	Rejecting	Agrees or disagrees with previous statement.
Neutral to judging	Judging	Level of emotional display (either negative or positive).
Task-Centered to Peripheral	Task	Closeness of statements to the job of evaluating the art--not a scale of abstractness.
Open to closed	Open	Inclusion of or request for multiple considerations.

Other ground rules that were established are the following:

1. Tapes were to be judged in units--that is, the three tapes representing the three evaluative sessions of one teacher talking with one student would be judged at one time. This would make possible the two following rules.
2. The judgment for the first statement on the first tape was arbitrarily set at two. Each statement, thereafter on all three tapes, would be judged for newness on the basis of all the statements that have gone before.
3. In so far as possible the judgements on each criterion were to represent movement from the base of the individual rather than a constant judgment relative to the entire sample. It was felt that an indication of individual change would give a better basis for application. If for example, "task" was found to be of value, a teacher would not have to take a test to determine whether he used a sufficient number of task statements, rather he would know that no matter how he raced on task now--to increase in task would probably result in more student learning.
4. Judgments were to be made on both student and teacher statements.
5. Since tapes varied in length and because it soon became apparent that there was little or no change from the beginning to the end of each tape, it was determined to judge no more than 113 ft. of each tape at the rate of 1 7/8 ft. per second.
6. The criteria were to be judged in pairs. Since the distinctions are close between the two parts of (1) new and repetition, (2) rejecting and judging, and (3) task and open, it was felt that

one person could do a better job of keeping the two separate. During the actual judging human energy was to be conserved by having each criterion judged by only one person (60 tapes X approximately 60 statements each X 6 criteria = 21,600 judgments.

A total of 44 tapes were judged in this manner. The tapes from three students were not judged because their test material was incomplete. All of the tapes from another student had to be rejected because they were too vague to understand. Thus, four students representing 12 tapes were lost. Four students had one tape that was too vague to understand. Thus complete data were available for 16 students and their teachers. Each teaching team was represented by from two to three tapes.

Judge Agreement and Reliability

To test for judge agreement all three judges initially judged all six criteria for 64 statements on one tape. This meant that they listened to one tape three times making two judgments each time. The agreement was found to be acceptable. As shown in Table III all the coefficients of correlation are well above the .01 level of significance.

Since only one person was to judge each criterion it was important to know whether the judges would still be making judgments the same way at the end of judging--a process that required a week of intense work. Therefore the tapes that were judged first were rejudged at the very end of the week of judging. Table IV shows that the judges were all able to repeat their judgments well above the .01 level. The judge for repetition was most accurate with .992--the judge for rejection was least accurate with .507.

TABLE III

CORRELATION MATRICES OF INDEPENDENT JUDGES' SCORES
ON EACH OF THE VERBAL JUDGMENTS
N = 64 statements

		A*	B
Newness	B	.709	
	C	.611	.649

		A	B*
Open	B	.443	
	C	.453	.780

		A*	B
Repetition	B	.821	
	C	.812	.730

		A	B
Judging	B	.743	
	C*	.727	.838

		A	B*
Task	B	.460	
	C	.537	.467

		A	B
Rejecting	B	.607	
	C*	.635	.587

*Judge for that criterion for all tapes on final study.
1 All correlations are well above the .01 level of significance (.01 = .254 when DF = 62.

TABLE IV

CORRELATION OF VERBAL JUDGMENTS MADE ON
THE SAME TAPE AT THE BEGINNING AND AT
THE END OF THE JUDGING

N = 64 Statements		Judgement	
Judge	A	New	.597**
Judge	A	Rep	.922**
Judge	B	Task	.527**
Judge	B	Open	.608**
Judge	C	Rej	.507**
Judge	C	Judg	.691**

**Well above the .01 level of significance (.01 = .254 when DF = 62).

CHAPTER III

ANALYSIS OF THE DATA AND FINDINGS

Consistency of Verbal Behavior

Inspection of the judges' recording sheets showed that individual teachers and students were receiving fairly consistent scores on each criterion. Therefore means were calculated for each criterion for each student. A comparison of mean scores for the first period with scores for the last period (see Table V) revealed that verbal behavior was largely consistent between, as well as within, teaching periods. For the teachers, changes were noted only in the number of new questions. The students were more flexible with changes being made in judging, task, and openers.

An almost complete lack of consistency was found between a subject's behavior as a student and as a teacher (see Table VI). The percent of time spent talking and openers are the only measures of verbal behavior as a student which relate significantly to behavior as a teacher. There is a slight, but not significant tendency for the student to just reverse his behavior, as noted on the other criteria.

Relationship of Verbal Behavior to Personality

The dominant relationship between personality and verbal behavior for students is that those with high aesthetic interests are less likely to use rejecting and judging statements during any of the periods and are more likely to stick to the task and talk a lot during the first

TABLE V

CORRELATION OF MEAN SCORES ON FIRST AND LAST TAPES

N = 16

	Student	Teacher
New	.220+	.478
Rep	.735**	.548*
Rej	.769**	.538*
Judg	.703**	-.041+
Task	.489	.224+
Open	.541*	.398+
% Time	.621*	.700**

+Variables selected for study of directional trends between first and last tapes.
* .05 level of significance.
** .01 level of significance.

TABLE VI

CORRELATIONS BETWEEN VERBAL BEHAVIOR OF THE SAME SUBJECTS ACTING AS STUDENTS AND AS TEACHERS

N = 12

New	-.306
Rep	-.124
Rej	-.205
Judg	-.303
Task	.041
Open	.555*
%	.663*
Length	.011

* .05 level of significance.

period. Students who make more open statements are not likely to be complex. Students who make progressively more new statements are likely to score high in originality. Teachers high in aesthetic interests are also less likely to make open statements. The teacher who scores high in complexity is likely to be less judging in his statements and will probably stick closely to the task.

Teachers who are high in originality are likely to be rejecting and talk a lot. The independent teacher is likely to be judging and not open during the first period and seldom repeats himself.

Factor Analyses of Verbal Behavior

Because behavior as a student did not relate to behavior as a teacher it seemed appropriate to undertake separate factor analyses for student statements and for teacher statements. For the students three factors were found:

1. Length - consisting of the per cent of time spent talking, the length of statements, newness and repetition.
2. Task - consisting of task and open.
3. Judging- consisting of rejecting and judging.

Three factors were also found for the teachers:

1. Length - consisting of per cent of time spent talking, length of statements, and repetition.
2. Rejecting- consisting of rejecting, judging and task. Task is negatively related to the other two.
3. New - consisting of new and openness.

TABLE VII

SIGNIFICANT CORRELATIONS BETWEEN MEASURES OF STUDENT CREATIVITY AND STUDENT VERBAL BEHAVIOR

N = 16

	ISSD Complexity	ISSD Aesthetic	BBC1-X3 Originality
S Rej-1		-.579*	
S Rej-M		-.511*	
S Judg-1		-.707**	
S Judg-2		-.542*	
S Judg-M		-.576*	
S Task-1		.574*	
DS New			.519*
DT Open	-.552*	-.564*	
T Task-1		.503*	
TL-1		.445*	

* .05 level of significance.
** .01 level of significance.

TABLE VIII

SIGNIFICANT CORRELATIONS BETWEEN MEASURES OF TEACHER CREATIVITY AND TEACHER VERBAL BEHAVIOR

N = 16

	ISSD Complexity	ISSD Aesthetic	BBC1-X3 Originality	BBC1-X3 Independence
S Judg-1	-.531*			.561*
S Task-2				
T Rep-2				-.596*
T Rep-M				-.559*
T Rej-2			.588*	
T Rej-M			.568*	
T Judg-1		-.503*		
T Task-2	.663**			
T Task-M	.505*			
T Open-1				-.571*
T Open-2		-.534*		
T %-1			.693**	

* .05 level of significance.
** .01 level of significance.

TABLE IX

ROTATED MATRIX OF FACTOR LOADINGS FOR STUDENT VERBAL BEHAVIOR[1]

	F 1	F 2	F 3
FACTOR I - LENGTH			
S New-1	0.71171*	-0.04229	-0.05390
S New-2	0.50809*	0.19152	-0.45513
S New-M	0.87315*	0.03924	-0.06558
S Rep-1	0.89103*	0.16196	0.18927
S Rep-2	0.84810*	0.24068	-0.04992
S Rep-M	0.79644*	0.47875	-0.15716
S %-1	0.82839*	-0.21352	-0.13089
S L-1	0.70266*	0.26070	-0.18087
S %-2	0.85678*	-0.04051	0.17617
S L-2	0.89735*	0.28572	-0.04121
S %-M	0.85849*	-0.27863	0.01969
S L-M	0.89846**	0.25134	0.12781
FACTOR II - TASK			
S Task-1	0.00138	0.71319*	-0.41707
S Task-2	-0.00633	0.75890*	-0.05996
S Task-M	0.01894	0.91660**	-0.13864
S Open-1	0.19085	0.75559*	-0.32132
S Open-2	0.44389	0.66425*	-0.32044
S Open-M	0.46702	0.76991*	-0.04558
FACTOR III - JUDGING			
S Rej-1	0.05565	-0.73045	0.53527
S Rej-2	-0.33243	-0.40510	0.67776*
S Rej-M	-0.15083	-0.58621	0.64019*
S Judg-1	0.21562	-0.62613	0.59962
S Judg-2	0.10189	-0.13523	0.91274**
S Judg-M	0.09313	-0.24480	0.89941*

1 Before rotation FI accounted for 42% of the total variance, FII accounted for 27% and F III accounted for 7%.

* Indicates highest loading on any factor for this variable.

** Indicates highest loading on this factor for any variable.

TABLE X

ROTATED MATRIX OF FACTOR LOADINGS FOR TEACHER VERBAL BEHAVIOR[1]

	F 1	F 2	F 3
FACTOR I - LENGTH			
T %-1	0.75254*	0.17160	-0.31772
T L-1	0.70182*	-0.12774	-0.15632
T %-2	0.69217*	-0.07163	-0.21509
T L-2	0.70976*	0.03146	0.37151
T %-M	0.90833**	0.00198	-0.18549
T L-M	0.83696*	0.10665	0.15120
T Rep-1	0.78100*	0.19838	0.06441
T Rep-2	0.55466*	0.04451	0.54753
T Rep-M	0.76869*	0.13912	0.25429
FACTOR II - REJECTION			
T Rej-1	0.17917	0.76415*	0.02313
T Rej-2	0.01036	0.82535*	-0.31513
T Rej-M	0.12786	0.87497**	-0.17765
T Judg-1	0.09150	0.46306*	-0.21847
T Judg-2	0.43284	0.64161*	0.20489
T Judg-M	0.37367	0.80399*	0.06356
T Task-1	0.26639	-0.63463*	0.02067
T Task-2	0.03938	-0.62337*	-0.11807
T Task-M	0.17880	-0.85935*	-0.11244
FACTOR III - NEW			
T New-1	-0.11231	0.11349	0.81075*
T New-2	-0.19754	0.07430	0.63435*
T New-M	-0.04684	0.14273	0.80760*
T Open-1	0.41654	-0.28075	0.58707*
T Open-2	0.01459	-0.19897	0.75151*
T Open-M	0.16878	-0.27084	0.81883**

1 Before rotation FI accounted for 27% of the total variance, FII accounted for 21% and FIII accounted for 16%.

* Indicates highest loading on any factor for this variable.

** Indicates highest loading on this factor for any variable.

Correlations of Verbal Behavior with Learning

Table XI gives the significant correlations between judgments of teachers' and students' statements and students' learning in art. Table XI actually consists of three tables - one table contains correlations for all students (n = 16), one for divergent students (N = 10), and one for spontaneous students (N = 6). It will be observed that, in some cases, students of the different strategies learn best under different types of verbal treatment. For the reader's ease of interpreting these tables the variables of verbal behavior have been grouped into their appropriate factors.

Correlations between verbal behavior and learning in art suggest that it may be well for all students to refrain from judging or becoming emotional, and to remain open in their statements, since these relate positively to strategy growth. For students to talk a large part of the time correlates with aesthetic growth.

As might be expected, for the teacher to talk a lot relates negatively to student growth in aestheticism. The other force which the teacher can exert on the learning of all students is to use open and new statements. These correlate with strategy growth.

Differences between the spontaneous and the divergent sections of Table XI suggest that the ratio of student and teacher talk is certainly important for the divergent students but not necessarily as important for the spontaneous students. It is also important for divergent students to refrain from judging and for teachers of spontaneous students to get away from the task.

Teacher open statements are good for the strategy growth of both spontaneous and divergent students but teacher open statements may have

TABLE XI

SIGNIFICANT CORRELATIONS BETWEEN STUDENT ART GAINS AND VERBAL BEHAVIOR FOR STUDENTS AND TEACHERS

ALL N = 16

	Aesthetic, Relative				Aesthetic, Internal				Strategy			
	D	S	T	W	D	S	T	W	D	S	T	W
S Jud-1*										-.537*		
S Jud-M*											-.518*	
S Task-2*										.598*		
S Task-M*											-.524*	
S Open-2										.623**		
S Rep-1							.506*					
S %-2			.540*				.535*					
S L-2						.499*						
S %-M			.573*		.508*		.610*					
S L-M*						.551*						
DS New									-.508*			
DT Task						.516*						
T Judg-2	-.535*									.567*		
T Task-2		-.526*										
T Open-2											.512*	.522*
T New-1										.528*		
T New-2										.491*		.542*
T New-M										.679**	.531*	.644**
T Rep-1			-.670**		-.561*							
T Rep-2	-.646**		-.742**	-.566*	-.547*			-.502*		.603*	.689**	.666**
T Rep-M	-.555*		-.738**		-.568*							
T L-1			-.749**									
T L-2	-.517*		-.715**		-.621*		-.585*	-.659**				
T %-M			-.573*		-.508*		-.610*					
T L-M			-.506*		-.528*							

TABLE XI
(continued)

DIVERGENT N = 10

	Aesthetic, Relative				Aesthetic, Internal				Strategy			
	D	S	T	W	D	S	T	W	D	S	T	W
S Rej-2									-.655*		-.678*	-.655*
S Judg-1										-.688*		
S Task-1			-.659*				-.563*					
S Open-2										.704*		
S New-2		.760*										
S New-M		.618*										
S Rep-1						.596*						
S Rep-2						.677*						
S Rep-M						.516*						
S %-1			.640*			.563*	.566*					
S %-2						.539*	.539*					
S L-2						.677*						
S %-M		.671*	.694*			.625*	.666*					
S L-M						.632*						
DT Task							.542*					
T Judg-1												-.700*
T Task-1						-.740*	-.647*					
T Task-2		-.712*				-.610*						
T Task-M						-.625*						
T Open-1	-.613*	-.574*	-.669*		-.576*		-.544*	-.576*			.531*	
T Open-2										.728*	.695*	
T Open-M	-.627*		-.637*		-.645			-.645*				
T New-1	-.562*			-.562								
T New-M								.554*	.551*			
T Rep-1			-.846**									
T Rep-2	-.633*		-.818**	-.633								.637*
T Rep-M			-.865**									
T %-1		-.657*	-.640*			-.563*	-.566*					
T L-1		-.874**										
T %-2						-.565*						
T L-2	-.560*		-.854**				-.545*	-.658*				
T %-M		-.671*	-.694*			-.625*	-.666*					
T L-M							-.538*	-.516*				

TABLE XI
(continued)

SPONTANEOUS N = 6

	Aesthetic, Relative				Aesthetic, Internal				Strategy			
	D	S	T	W	D	S	T	W	D	S	T	W
S Task-2									-.872*			
S Open-1									-.850*			
S Open-2	.812*											
S Rep-1			.841*									
S Rep-2	.815*		.853*									
S Rep-M			.823*									
T Rej-M									.872*			
T Judg-1									.949**			
T Judg-2	-.977**				-.814*							
T Task-2	.853*											
D T Open		.800*		.800*								
T New-2										.900*	.900*	
T New-M										.895*	.895*	
T Rep-2							-.847*				.911*	
T Rep-M	-.853				-.923**							

* .05 level of significance.
** .01 level of significance.

negative effects on the aesthetic growth of divergent students.

The dominant picture of all three sections of Table XI is that student talk relates positively to aesthetic growth, while teacher new statements relate to strategy growth and slightly favor spontaneous students. (That both spontaneous and divergent students have strategy gains in spontaneity may be an expression of the value of depth training in the teaching of spontaneity.)

Sequence of Statements

In order to determine what type or types of statements might follow different types of statements, the six factors* for student and teacher statements were entered as variables on a correlation program according to the following scheme:

	1st T. Statement	1st S. Statement	2nd T. Statement	2nd S. Statement
Case No. 1	1. Length 2. Rej 3. New	4. Length 5. Task 6. Judg	7. Length 8. Rej 9. New	10. Length 11. Task 12. Judg
	2nd T. Statement	2nd S. Statement	3rd T. Statement	3rd S. Statement
Case No. 2	1 2 3	4 5 6	7 8 9	10 11 12
	3rd T. Statement	3rd S. Statement	4th T. Statement	4th S. Statement
Case No. 3	1 2 3	4 5 6	7 8 9	10 11 12

Significant correlations revealed the sequence patterns repeated in Table XII, XIII, and XIV. Different sequences, it will be observed, result

*The score for each factor was that score obtained on the level variables of that factor.

when the students and teachers were grouped differently according to strategy and predisposition for learning. If we assume that the sequences repeated for all teaching teams is a natural, or at least a typical sequence--and it does look logical-- then we can rate the various possible combinations of students and teachers according to the naturalness of the flow of conversation. In Tables XII and XIII asterisks (*) follow sequences that are less natural or less typical.

It will be observed that the most natural or typical sequence pattern occurs when a closed teacher talks with an open student. This is particularly important as it will later be shown that this arrangement results in the most learning in art.

Learning in Art and Grouping of Teacher and Student According to Strategy

Because of the small population, an analysis of variance using classification of both strategy and predisposition, would have resulted in numerous blank cells. Therefore a two factor analysis of variance was undertaken for grouping of students first according to strategy and second, according to predisposition. As dependent variables all the art gain scores and all of the verbal behavior measures were used.

Few significant differences in learning or talking were found when students and teachers were grouped according to strategy, and those that were found seem to be of small importance. Spontaneous judges feel that students of spontaneous teachers gain more in aesthetic quality while divergent judges prefer the work of students working with divergent teachers. These findings can only be interpreted as an expression of judge prejudice.

TABLE XII

SEQUENCE OF STATEMENTS WHEN STUDENTS AND TEACHERS ARE PAIRED ACCORDING TO STRATEGY

Student	Teacher: Spontaneous	P =	Teacher: Divergent	P =
Spontaneous	N = 59 Statements		N = 144 Statements	
	*T. Rej → S. Task	.05	T. New → S. Long	.05
	T. Rej → S. Judg	.01		
			*S. Long → T. Rej	.01
	*S Judg → T. Rej	.01	*S. Long → T New	.05
Divergent	N = 169 Statements		N = 161 Statements	
	*T. Long → S. Long	.01	T. New → S. Long	.05
	*T. New → S. Task	.01	S. Judg → T. New	.01
	*S. Task → T. Long	.01		
	*S. Long → T. Rej	.05		

*Not a typical sequence

TABLE XIII

SEQUENCE OF STATEMENTS WHEN STUDENTS AND TEACHERS ARE PAIRED ACCORDING TO PREDISPOSITION

Student	Teacher: Open		Teacher: Closed	
Open	N = 133 Statements	P =	N - 186 Statements	P =
	*T. Rej → S. Long	.05	T. Rej → S. Judg	.05
	T. New → S. Long	.01	T. New → S. Long	.05
	*T. New → S. Task	.05		
			*S. Judg → T. Rej	.01
	S. Judg → T. New	.01	S. Judg → T. New	.05
Closed	N = 140 Statements		N = 74 Statements	
	*T. Long → S. Long	.01	*T. Rej → S. Task	.01
			T. Rej → S. Judg	.01
	*S. Long → T. Long	.01		
	*S. Task → T. Rej	.05	*S. Judg → T. Rej	.05
			S. Judg → T. New	.05

*Not a typical response

TABLE XIV

TYPICAL SEQUENCE OF STATEMENTS

N = 533 Statements	P =
T. Long → S. Task	.05
T. Rej → S. Judg	.01
T. New → S. Long	.01
S. Judg → T. New	.01

Learning in Art and Grouping of Teachers and Students According to Predisposition

When analyses of variance were computed for predisposition using the same methods and dependent variables described above the results were both rewarding and revealing (Table XV through XX). First, and perhaps most important, closed teachers have students that learn more in terms of total strategy growth, especially growth in spontaneity. Second, the differences in learning are explained in terms of verbal behavior. When a closed teacher talks with an open student, the student uses more task and judging statements. Student task statements correlate with gains in spontaneity for divergent students and student judging statements correlate with gains in divergency for spontaneous students. Closed teachers use more new statements and fewer task statements. The former correlates with gains in strategy for all students and the latter correlates with gains in aesthetic quality. The order of effects for all the analyses of variance is the same: closed teacher and open student, over closed teacher and closed student, over open teacher and open student, over open teacher and closed student. Thus predisposition of the student is important but not as important as the predisposition of the teacher.

Measures of Predisposition

Because teacher predisposition proved to be so important it seemed necessary to look at the individual measures of predisposition for the teachers and to determine whether they might predict learning. In Table XXI, with only one exception, each of the measures predicts high gains in aesthetic quality and low strategy gains.

Summary

This study has thus described personality factors that relate to the quality of the teacher (closedness) and to the quality of the student (openness). It has further shown that maximum learning occurs when a closed teacher talks with an open student. Paralleling the increased learning when a clcsed teacher works with an open student are verbal sequence patterns which are more typical and individual verbal traits which correlate with total strategy learning in art, learning in one's opposed strategy, and aesthetic gains in art.

TABLE XV

ANALYSIS OF VARIANCE FOR TOTAL STRATEGY GAINS IN ART

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	124.0179	124.0179	3.5137	.10
Student	1	4.6607	4.6607	0.1320	
Error	13	458.8393	35.2953		

*Interaction is not significant and is therefore assumed to be zero.

Closed teacher and open student (20.1) > closed teacher and closed student (19.0) > open teacher and open student (14.5) > open teacher and closed student (13.4).

TABLE XVI

ANALYSIS OF VARIANCE FOR SPONTANEOUS GAINS IN ART

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	143.4337	143.4337	7.4163	.05
Student	1	1.9515	1.9515	0.1009	
Error	13	251.4235	19.3403		

*Interaction is not significant and is therefore assumed to be zero.

Closed teacher and open student (11.0) > closed teacher and closed student (10.3) > open teacher and open student (4.9) > open teacher and closed student (4.3).

TABLE XVII

ANALYSIS OF VARIANCE FOR STUDENT TASK STATEMENTS

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	751.5007	751.5007	1.0916	
Student	1	491.3723	491.3723	0.7137	
Interaction	1	4147.8000	4147.8000	6.0248	.05
Residual	12	8261.5000	688.4583		

Closed teacher and open student (2.67) $>$ closed teacher and closed student (2.56) $>$ open teacher and open student (2.53) $>$ open teacher and closed student (2.42).

TABLE XVIII

ANALYSIS OF VARIANCE FOR STUDENT JUDGING STATEMENTS

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	81.6129	81.6129	0.3727	
Student	1	368.6137	368.6137	1.6834	
Interaction	1	1052.8400	1052.8400	4.8082	.10
Residual	12	2627.6200	218.9683		

Closed teacher and open student (5.98) $>$ open teacher and open student (5.26) $>$ open teacher and closed student (4.21) $>$ closed teacher and closed student (3.79).

TABLE XIX

ANALYSIS OF VARIANCE FOR TEACHER NEW STATEMENT

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	1056.0100	1056.0100	3.4223	.10
Student	1	137.9600	137.9600	0.4471	
Error	13	4011.4200	308.5708		

*Interaction is not significant and therefore assumed to be zero.

Closed teacher and open students (1.70) > closed teacher and closed students (1.64) > open teacher and open students (1.54) > open teachers and closed students (1.48).

TABLE XX

ANALYSIS OF VARIANCE FOR TEACHER TASK STATEMENTS

Source of Variation	D.F.	Sums of Squares	Mean Squares	F-Ratio	P =
Teacher	1	915.3000	915.3000	4.1931	.10
Student	1	3.7000	3.7000	0.0170	
Error	13	2837.7000	218.2846		

*Interaction is not significant and is therefore assumed to be zero.

Open teacher and open student (2.85) > open teacher and closed student (2.84) > closed teacher and open student (2.70) > closed teacher and closed student (2.69).

TABLE XXI

SIGNIFICANT CORRELATIONS BETWEEN STUDENT ART GAINS AND MEASURES OF TEACHER PREDISPOSITION AND CREATIVITY

ALL N = 16

	Aesthetic, Relative				Aesthetic, Internal				Strategy			
	D	S	T	W	D	S	T	W	D	S	T	W
	5	6	7	17	23	24	25	29	11	12	13	14
BBC1-X3 Word Pairs+									-.789			
SDT P_t+	.703		.500		.629		.550	.515	-.623			
WET+									-.502			
ISSD Complexity		-.539										
FAT Flexibility										-.581		

+measures of predisposition - all other measures are of creativity.

CHAPTER IV

CONCLUSIONS AND IMPLICATIONS

Support for Hypotheses

The first hypothesis "Teachers that are highly predisposed will use more 'entries' than will teachers that are lower in art learning predisposition," must be rejected. Evidence shows that just the opposite is true. Significant at the .10 level, closed teachers (teachers low in predisposition) use more "entries" or new statements than do open teachers (teachers high in predisposition).

Hypothesis number two "The use of more 'entries' will relate positively to learning in art" must be accepted. Eight significant correlations show that "entries" or new teacher statements relate positively to aesthetic gains in art. The fact that the relationship for the divergent students is slightly less than significant is easily explained by recent research by Beittel (3) which shows that divergent students do not learn as well as spontaneous students when they work in depth with one material.

Hypothesis number three "Teacher statements that are more open and task-centered will relate positively to learning in art," is partially accepted. Three significant correlations show that teacher open and task statements relate positively to gains in aesthetic quality for spontaneous students. For divergent students, however, the relationship is negative, as shown by 17 significant correlations. Still teacher open statements do relate positively to gains in strategy as shown by three significant correlations.

Hypothesis number four "When the teacher and student are of unlike strategies, the teacher will use more 'entries' and they will be more open and task centered," must be rejected. No significant relationship was found between strategy of student or the teacher and any measure of verbal behavior used in this study. The important distinction is not strategy but predisposition.

Hypothesis number five, "Longer student responses will be positively related to learning in art," must be accepted. Eighteen significant correlations show that gains in aesthetic quality are positively related to the length of student statements and to the per cent of student talk. Conversely, 27 correlations show that the length of teacher statements and the per cent of teacher talk is negatively related to gains in aesthetic quality.

Identity of the Teacher and Student

It is clearly seen that the teacher is different from the student. When students become teachers they act differently--some patterns of verbal behavior are almost reversed. Moreover, the personality structure of the good teacher seems to be opposite that of the good student. It is of positive value for students to be high in theory, to have a creative orientation, to have aesthetic interests, to rate themselves highly, to be interested in process and to be able to rank the same objects in different orders. These qualities, however, seem to be of negative value for the teacher. Thus the student should be open to new experience and the teacher should be fairly rigid in his ideas. Moreover, if we observe the negative value of flexibility, complexity and fluency (per cent of

teacher talk), extreme doubt is cast on the value of what has been considered a creative teacher. Since the two roles are different and since students change their verbal behavior when they become teachers, it would seem desirable to prepare students for teaching by techniques that will build up an image of what the teacher should be (give the student an idea of what to become) and techniques that will teach and give the student practice in the teacher's role during interaction.

Extreme doubt is also cast on the value of a passive supporting role for the teacher. The teacher, it appears, must have definite ideas of his own. He may even serve as an image of society against which the student tests his idea. This image of the teacher does not reject the "midwife" concept of Plato but rather amplifies it and suggests that the encounter of teacher and student may be a time of pain for the student and skilled help from the teacher.

Pain, in so far as it is painful to examine the consistency of one's thoughts, seems to be minimized when the student is open, and the teacher seems to be most skillful when he is closed. When the student is already pregnant with ideas (predisposed) the teacher's job is simpler. When the student is not open to learning the teacher may be faced with the problem of fertilization as well as delivery. An open teacher is a real handicap to an open student but nature takes its course and the student will deliver. The situation is somewhat hopeless when the student is not pregnant and the teacher is afraid to fertilize. In terms of verbal behavior we see the open student and closed teacher conversing in patterns that supplement one another. The teacher makes a new statement, for example, and it is followed by a long student statement. The former is good for strategy growth and the latter is good for aesthetic growth.

At the other extreme, the closed student talking to the open teacher, the pattern of their talk tends to negate itself. A long student statement (usually producing aesthetic growth) is followed by a long teacher statement (usually producing aesthetic loss) and teacher new statement (usually producing strategy gains) are followed by student task statements (which produce losses in strategy).

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APPENDIX A

TRANSCRIPTS OF TAPES

The transcripts of tapes reproduced here represent approximately the first 70 feet of the first period that a particular student talked with his teacher. The speeches are divided just the way they were judged. Parenthetical statements represent statements that seemed to only acknowledge the continued attention of the listener. The numbers to the left of each statement, or unit of judgment, are a record of the actual judgments. The first number in the series expresses the length of the statement in terms of number of feet of tape at the rate of 1-7/8 feet per second. The other numbers represent judgments on a one-to-three scale.

The first tape is the one that was used for testing judge agreement and reliability. The second tape was made by the same two people after they had exchanged roles. The two are a fine example of the tendency for openness and per cent of talk to remain constant. The first tape, with an open teacher and a closed student, represents the lowest strategy gains in art--only eight points out of a possible 39. In the second tape, where the closed subject is now the teacher, the student gained 25 points--one of the highest.

The third tape was made by two open subjects who converse in vague (open) generalities. Tape four was made by two closed subjects. As might be expected, gains in both cases were about average--15 points and 12 points respectively.

The fifth tape was made by the student who gained more than any other student--28 points. The student is open, of course, and the teacher--the teacher is closed, naturally!

TAPE ONE

STUDENT: Divergent - Closed

TEACHER: Spontaneous - Open

Length	New	Rep	Task	Open	Rej	Judg		
1-2	1	3	3	1	1		T.	Suppose that you begin by telling me what you were trying to achieve here.
3-2	2	2	2	2	2		S.	Well, at the beginning I really didn't have too much in mind - I am too tight and I am just trying to see if I can find a way to loosen up and ahh (T. Yes) That's my solution, loosening up - I just looked at the pictures, looked at the collection of material and the first thing that came to mind I drew.
1-1	1	3	1	1	1		T.	Then that's what you are trying to do--loosen up there--(S. Loosen up, yes). Well, do you think that it is working?
2-1	3	3	3	2	2		S.	Well, I'm not really loosening up - I am still tense - I'm still tight - I'm still rigid - I'm still detailing - but I'm not as tight as I used to be in the subject matter - No. I haven't loosened up yet - that's it.
1-2	1	3	1	1	1		T.	Well, do you think that you are following the still life too closely, or --
2-2	3	2	2	3	3		S.	No, I think it is just my background. I started out in architecture - (t. Yes) Well, I haven't got rid of that background, and I don't want to get rid of it. (T. You don't want to?) No, I'll put that on tape, I don't want to get rid of that background. I like to be tight. (T. You like to be tight?) Right, I can't loosen up - it is just against me - I think if I loosen up it looks sloppy.
1-2	1	3	1	1	1		T.	Then your idea of something good is something like what you have done here.
1-1	1	1	1	3	2		S.	Ahh - Define good - What do you mean by good?
2-2	2	3	1	2	2		T.	Well, I mean your idea of good in a painting or a drawing is something like this.

Length New Rep Task Open Rej Judg		
4-2 3 3 2 2 1	S.	Well, this really does not have much detail - if you could have seen my other drawings - granted there's detail - the fourth is done very loosely, of course (I. Yes). The third isn't done quite so much, but I'll admit there is some detail here, some detailing, but not as much as the other drawings - the other drawings I was doing - I look at the still life and draw it exactly the way I saw it, and I draw the whole thing not just one little segment, but I draw everything just as it appears--as it should appear.
1-2 1 3 1 1 1	T.	And here you are taking portions of it?
6-1 3 3 3 1 1	S.	And here I am taking portions - here the first element is part of the door - there were just a few pieces of wood there, but I took it to indicate a door and I just drew a door out - in a funny proportion - it's coming out and twisted - the planes are not parallel - here it's coming out of proportion - you can see that it's coming off from a vanishing point. (T. Yes) These two lines are out of proportion. I just wanted to twist it that way - this piece of wood here - just a piece of junk actually - just a piece of junk wood - and I just threw it together and I had no idea of form - I don't know why I put it together like that, but that's the way it went together. I looked at that gourd there and I thought of a bowling ball - that's why it looks like a bowling ball and shows up in there.
1-1 1 2 1 1 1	T.	Let's see - your idea of loosening up then is getting rid of detail and this stuff.
6-3 3 3 3 3 2	S.	No, my idea of loosening up right now - instead of taking the still life as it is, I am taking the still life apart. I'm trying to get action - get movement - here you can see that there is movement. (T. Yes.) Supposedly, there are some still elements - this is held by an oversize nail - but it is held in an imaginary plane - where the film - the movie film is winding around through there so it kind of negates the fact that this is on a plane because the three seems to be behind the picture, and yet you can't see a distinguishable plane. The door is going back - this sign here is floating. (T. In other words,) If you suggest a plane here and yet there's not a plane - I want a little more (T. Spatial) Yes, spatial development.

Length	New	Rep	Task	Open	Rej	Judg		
1-2	1	3	1	1	1		T.	But do you still like these angular lines?
2-1	2	2	2	2	1		S.	I still like to be rather stiff - I won't say this is exactly still. I can work much stiffer than this - but this is as loose as I want to get. (T. Yes) As quick - I like to be slow and methodical.

TAPE TWO

STUDENT: Spontanecus - Open

TEACHER: Divergent - Closed

1-2	1	3	3	1	1		T.	First thing - what are you trying to do?
1-3	1	2	2	3	3		S.	I'm not really trying to do anything - I just drew - really I was working a little bit with line last time.
0-1	1	3	1	1	1		T.	Working with line - in which ones?
1-1	1	2	2	1	2		S.	In both of them and in these I want more line - moving line - as in this last one.
3-3	1	3	2	1	1		T.	I see moving line. Ahh - I can see right now that you are almost totally opposite me - at least in your basic approach right now - ahh - it looks like you get these done in a hurry. Do you get these done very fast or what?
1-1	1	2	1	1	1		S.	Yes, I did about seven of these last time.
2-2	1	2	1	1	1		T.	What did you do - the first thing that comes to mind - just sit down and start throwing things together, or do you sit down and think?
1-1	1	2	1	3	2		S.	No, I don't think - I just sit down and start drawing - it's usually the same thing over and over again, but I --
1-1	1	3	3	2	2		T.	That's what I noticed. Everyone seems to be, basically the same thing with little variation. But, ahh --
0-2	1	3	1	2	2		S.	Well, there is one that is different there.

Length New Rep Task Open Rej Judg		
2-1 1 2 1 1 1	T.	Well, this one right away looks different. (S. You mean this one here.) You've got round and round and round written on it - is that trying to get the feeling of motion by putting the word round in, or --
1-1 2 1 1 3 3	S.	No, I just wrote round and round and round on it - I was looking around the room -
2-3 2 2 2 1 2	T.	Some of these - well quite a few of these in fact - you can't tell which is top, bottom or side - at least I can't at the moment, ahh - are they intended to be that way? Do you intend them to be looked at at any view, and angle?
1-1 1 2 2 3 3	S.	No, they have a bottom - they have a top - - - I think you can see the top and bottom.
3-1 3 1 2 3 2	T.	What I mean is, (S. Yeah) Take this number off and you could look at quite a few of these not knowing what they were - if you didn't know what they were, of course, you are the artist (S. Ahh) but if you did not know what they were you would not know which angle, which edge to put them on. This one with the leaf in particular, without the leaf you can't tell at all, the long edge or the short edge - either long edge or short edge, (S. mmm) except for the fact that you've got the number - the 102 down here.
2-1 1 1 1 3 1	S.	Well, I didn't really intend to do that - mostly you can tell which end is up. (T. Yes) Like I said, these two are just experiments.
1-2 2 2 3 2 1	T.	What do you mean - you said experiments - what do you mean by experiments?
2-1 1 2 2 3 3	S.	Well, like I said, I was working with line and then I used the pen for the first time, which I wish I hadn't of.
1-1 1 2 1 1 1	T.	You used pen for the first time. In which one was the pen used?
1-1 1 1 1 2 2	S.	There - I just used it very lightly. I didn't use it that much.

Length New Rep Task Open Rej Judg		
1-1 1 2 1 1 1	T.	All you did, in essence, then was to use the pen just as a - at the end just as a little added texture.
0-1 1 2 2 2 1	S.	Yeah - I don't like it.
1-2 1 3 3 1 1	T.	What don't you like about the pen?
1-2 1 2 1 2 2	S.	I don't know - I like big, bold lines. I don't like fine lines.
1-1 1 3 1 1 1	T.	Well, is that what you like about the brush. (S. Yeah) Then the bold lines.
1-2 1 2 2 1 1	S.	And you can get more variation with a brush.
5-1 2 1 2 3 3	T.	Well, I can disagree with you there - in fact, I would like to but I will not disagree. (S. Well, what) I would like to disagree with that strongly - well with a pen you can get (S. Oo, I) more variation than you can with a brush (S. you mean with a) but not necessarily, but with the point or edge and different varying weights - you can get the points to separate and you get a fine lines - close, fine lines.
1-1 1 1 1 3 3	S.	Yes, but there is not as much variation as I like and with a brush you can get a very fine line if you want.
2-1 1 1 1 3 2	T.	If you want to - it can be difficult to get the fine lines. (S. Well, if you say so.) Well, let's leave the pen and brush argument go for a little while - it is just so much extraneous remarks . . .

TAPE THREE

STUDENT: Divergent - Open

TEACHER: Divergent - Open

1-2 1 3 3 1 1	T.	Is there any drawing here - any part of the process that you would like to talk about?
9-3 3 3 3 1 1	S.	I think the only valid one is the product of the last one I did. (T. And, what do you feel interests you?) Well, I think that I solved the problem of putting down the thing that I wanted to get in the drawing - and I

Length
New
Rep
Task
Open
Rej
Judg

got it. I got more than that - which to me, to make a drawing that I really, really love - you have to get everything - when I make something like creative relation into development - what I have been doing in the past and what I am going to be doing to mean something to me - in my whole painting as a whole - where the others are more or less what I consider practice or tries.

1-2 1 3 2 1 1 T. In other words, you feel that all that you have done in this one is all summarized in . . .

2-1 1 3 3 1 1 S. In my final one - not only my other drawings are summarized in this last product - all my drawing experience of the past that I have had is summarized in there, too - and something beyond - something new that I have never done before. I like it.

1-1 1 3 2 1 1 T. You like it very much. (S. Yes.) Why?

0-2 1 3 2 1 1 S. I just said why. (T. Because it's a summary of) Well, it is an important step for me in my creative work.

2-2 1 3 1 1 1 T. Do you think that the still life helped you?

3-1 1 3 2 3 1 S. Well, it makes no difference - you are something there - and I found something there that I used or a stimulus on the still life.

6-3 1 3 2 2 2 T. Earlier you said that this as a result was an accumulation of the past - in these drawings that you did - the nine drawings that you did before you came to this one - were you concerned, therefore, with the product or with the process of doing. (S. Continued in the final one) In all of your drawings did you have a goal that you were working for that you feel you achieved here and that you were concerned with reaching this goal. Have you achieved it or how did you work?

5-2 2 3 2 3 2 S. How you achieve it is part of achieving it. You can't separate process from product because, well, you know one process goes with what you want for a product. I found out what the process was or should be to achieve it, and then I just did it in the final one. The others were an experiment, although this one was an experiment that worked. I don't know if it makes sense to you.

Length	New	Rep	Task	Open	Rej	Judg		
1-1	1	3	3	1	1		T.	Why do you feel that this one worked more than any of the others that you drew?
6-2	2	3	2	2	1		S.	Well, probably because it is more aesthetically good and, it works because what I put down, the form of lines and strokes, meant something - meant what I wanted it to mean - what I wanted it to do. In some of the others you could take away a line or a stroke and it wouldn't make much difference, where in this one it's there and it has to be there, I feel, to solve the problem.
1-1	1	3	1	1	1		T.	In other words, you did confront yourself with a problem and you worked with it. And, this is what you came to a conclusion of.
1-1	1	3	1	1	1		S.	Yes. (T. O.K., fine.)
3-2	1	3	3	1	1		T.	In your drawing you said that you liked the whole part of it. Is there any part of this drawing, any part that you especially like to elaborate on or carry forth?
19-2	1	3	3	3	2		S.	You mean use again in another drawing or painting. (T. Yes, some technique that you would like to develop.) Well, I don't know if I go along with that further developing technique, but I can say that in this work there is a continuation of the kind of thing that I would like to be involved with - that is line and direction, maybe, of drawing - in which, maybe, in that way it is relevant to my whole creative work. I don't know if I can just point it out. I think the whole drawing exemplifies that . . .

TAPE FOUR

STUDENT: Spontaneous - Closed

TEACHER: Spontaneous - Closed

1-2	1	3	3	1	1		T.	Would you like to tell me what you had in mind when you first began your drawing.
2-2	1	3	3	1	1		S.	Well, the first idea I had in mind, as a result of one of my classes, was to get an overall effect I

Length	New	Rep	Task	Open	Rej	Judg		
								wanted to achieve a sense of continuity, working all over the drawing, just lightly with no detail - getting an effect of the shapes, size and placement of the objects - exactly where I wanted them. Then perhaps later the detail would come in.
2	2	1	3	2	1	1	T.	Well, did you have some other thing in mind. Were you interested in getting a rich color, I mean in your value, or were you just interested in the pattern?
5	1	2	3	3	2	1	S.	I was interested in pattern in two respects. I like to get the feeling of the wire mesh, and I think that I did get it although I did not duplicate it. I wanted to get the feeling of decorativeness around the frame, which I gave with a sense of texture, although, again, I did not duplicate it. I wanted to get a sense of values. I think I succeeded in my final of having a gray tone, black and several other shades, although I do feel that there is too much of a jump from the one gray shape to the white. I think I could have had maybe one or two other values in there. I, well -
1	1	1	3	3	1	1	T.	I was going to say, if you started over again what would you have done differently to avoid having a sharp contrast?
1	1	1	3	1	1	1	S.	I think I would have put a gray, a slightly darker tone, around this one object.
0	1	1	3	1	1	1	T.	Do you think this is an idea that you would like to follow through - trying to get the all-over pattern?
4	1	2	3	2	1	1	S.	Well, I think so if you just do detailed work then I think that you don't get a whole all-over picture. You get a series of little pictures - a picture here - a picture here - things don't hold together like a unity. To get unity you have to work all over the paper at once. I found this out. This works for me. I think it is faster this way, too, because if you do it all over you get it done fast instead of worrying with one little point. You get busy with that. (T. Yes) I think you can work faster this way.
2	2	1	3	2	1	1	T.	I think you are right in that respect, because if you try to work for an all-over thing, you don't

Lengt	New	Rep	Task	Open	Rej	Judg		
								overwork on the part. I notice that you have a very close-up view of it. You went right to one spot and you tried to work from that spot and tried to develop it into an interesting arrangement.
5-1	3	3	2	1	1		S.	Yes, I usually do that because in this way if I do it all over I will have so many objects in my drawing that it will just be lost and I will have to do some detail (T. Yes.) Do you understand? (T. Yes.) I have to have so much in it that I think it will be cluttered. I like simplicity, as I think you can tell. (T. Yes.) Shape and a simplest form that I think is expressive. I think this close-up view that I just got several shapes that I liked, put them together in a pleasing way and avoided too much detail. I made them simple. This is the way I liked to work.
3-2	1	3	2	1	1		T.	You are definitely spontaneous then in your approach. Ahh, let's see. I notice - this in the second drawing down here - I notice that you took a little different area to concentrate on. I see again that you started out with a neutral gray.
3-1	2	3	2	2	2		S.	I don't like this one as well. I think the first one is much more successful. This is, ahh, I think I got a little messy and a little bit cluttered in this one. As you see, it's not as defined. I think the other one is more expressive. It is simpler. This one tends to get sort of messy, I think.
1-2	1	3	1	1	1		T.	Did you feel that this was finished, or would you like to spend more time on it?
1-1	1	3	1	1	1		S.	Oh, I just don't like it because it just doesn't seem to compare --
1-1	1	3	1	2	1		T.	You don't feel as though you reached your goal in that one. (S. No.) As well as the first one.
1-1	1	3	1	2	1		S.	No, I think the first one is what I like.

TAPE FIVE

STUDENT: Divergent - Open

TEACHER: Spontaneous - Closed

1-2	2	3	3	1	1		T.	I see that in your first shot there you started out

Length	New	Rep	Task	Open	Rej	Judg		
								with a single element. Is there any particular reason why you did this?
2-	2	2	3	2	1	1	S.	Well, I was concerned mostly with these circular shapes. It seemed that there was a gasket on top of this still life which really fascinated me and I thought I would center my drawing around this.
1-	2	2	3	2	1	1	T.	I see. And, in your shots here the biggest difference is between your third and fourth shots. Were you striving for something different? Were you striving to change it in some way?
3-	1	2	3	2	2	1	S.	Well, I thought that the third picture didn't occupy enough space on the sheet of paper, so I decided to expand it and get in a little more variety by getting in a few different textures, and, I don't know, just trying to occupy most of the space on the page.
2-	3	2	3	2	1	1	T.	Is there any particular way that you expanded this picture? I know you said that you started out with the gasket and then some of the boards. There still isn't too much texture in the third shot. What were you trying to strive for up until that point?
2-	2	2	3	3	1	1	S.	Well, usually when I start drawing something like this, I try to capture a mood or a feeling about the object that I am drawing. Actually, I feel that I can't really draw something unless I know what I am drawing. Actually, I was kind of exploring the still life.
3-	2	1	3	2	1	1	I.	I see that you try and get the composition down as a whole and then go from there. Now with your second series I notice that you started out again with the gasket, like you said before, this interested you, and you tried to fill up the whole page and just exploring the gasket. Would you like to explain that?
3-	2	2	3	2	1	1	S.	Well, like I said before, I was really interested in that gasket. It fascinated me. So I started over again by trying to fill the page with the gasket itself, and not different articles around it, and, well, I kind of played darks against lights. And, I don't know how successful it was, but I tried to explain this gasket.

Length	New	Rep	Task	Open	Rej	Judg		
1-2	1	3	2	1	1		T.	Do you feel that these pictures are complete as you wanted them in the time period allowed?
2-1	2	3	1	2	1		S.	No, I am not satisfied at all with this second set. I mean as far as I have gone, I think they are O.K., but I, well, they are not complete. There should be more, as far as I am concerned.
1-2	1	3	3	1	1		T.	Well, either in the first or second series, is there something that you would have done differently if you would have had more time to work on it?
1-1	1	3	2	2	1		S.	Well, I don't know. If I'd of had more time I would probably have gone off on, not on a tangent exactly, but I would of done more exploring, as in the fourth drawing. (T. In the first series?) Right.
3-3	2	3	3	1	1		T.	Why did you fill in some of the parts of the gasket? Is that the gasket there? (S. Yes.) You filled in certain sections with the dark object behind it blocking out part of it. Would you like to explain any of these particularly dark places? Was it just as you saw them, or were you just trying to work for contrast effect, or what?
i-2	2	3	1	1	1		S.	Well, in this case, there was actually a board behind this gasket and I, well, in this case, I was mostly trying to show contrast. I mean that I thought it would add more to the picture.
2-2	1	2	2	1	1		T.	Do you prefer to draw something just as you see it? Or, would you like to draw more or less as you feel at that time?
3-2	2	3	2	1	1		S.	Well, usually I like to draw things as I see them, more or less. Sometimes I get off on a tangent and I do vary a good bit. In this case, I was trying to get away from a copy of what I saw and was trying to bring a little emotion into it and just vary it in general, I guess.
1-2	2	3	2	1	1		T.	In your first series, like I said before, there is the greatest difference between the third and fourth shot, and in the second series there are only three pictures. And, do you think if there were a fourth picture, do you think you would have changed it much.

Length	New	Rep	Task	Open	Rej	Judg		
4-1	2	3	3	2	1		S.	Probably. Usually when I work under a time limit I will go along slowly until I get near the end, and then I may try to work real fast to finish the picture. And in doing this, a lot of my drawings sometimes change drastically. I think a lot of my drawings would have had a lot more variety and texture in a fourth drawing.

APPENDIX B

JUDGES' RECORD SHEET

T_____ S_____ GROUP_____ WEEK_____

Criteria								Criteria						
	T	S		T	S				T	S		T	S	
1								21						
2								22						
3								23						
4								24						
5								25						
6								26						
7								27						
8								28						
9								29						
10								30						
11								31						
12								32						
13								33						
14								34						
15								35						
16								36						
17								37						
18								38						
19								39						
20								40						

APPENDIX C

TABLE XXII

MEANS AND STANDARD DEVIATIONS FOR VERBAL CRITERIA

Criteria	Mean	Standard Deviation
S. New	1.293	.151
S. Rep	1.579	370
S. Rej	1.736	.365
S. Judg	1.489	.289
S. Task	2.536	.300
S. Open	1.967	362
S. %	60.000	43.836
S. Long	3.466	5.740
T. New	1.655	.327
T. Rep	1.257	199
T. Rej	1.225	186
T. Judg	1.163	.103
T. Task	2.773	.157
T. Open	1.960	.292
T. %	40.000	13.900
T. Long	2.195	9.241

APPENDIX D

ABBREVIATIONS USED IN TABLES

Interaction Criteria

New	New ("entry")
Rep	Repetition (within statements)
Rej	Rejection (yes-no)
Judg	Judging (emotion)
Task	Task (evaluating the student's work)
Open	Open (multiple viewpoint)
%	Per cent of total talk
Long	Length of statement
T	Teacher's statement
S	Student statement
D	Direction (increase or decrease for the 3 tapes--increase = 3)
1	First tape
2	Last tape
M	Mean of all tapes

Art Criteria

D	Divergent gains or divergent juoges
S	Spontaneous gains or spontaneous judges
T	Total of both strategies or all judges
W	Within student's own strategy or judge's of the same strategy as the student

APPENDIX E

REPLICATION

The analysis reported here is based on a study that was structured shortly after the principal investigator had noted the probable importance of new, or entry, statements. The problem was to determine whether more learning would result from the teacher's use of sustaining questions or from entry questions. The most important thing that this analysis shows is that when teachers try to be sustaining they also use more entries and that teachers who use more entries are also more sustaining. The discovery is that interest in the student, the use of sustaining statements and the use of entries all relate factorially. Thus the teacher with definite ideas (the closed teacher described in the conclusion) is also more likely to respect the student's own ideas. This finding reaffirms the value of a positive, rather than a passive teacher role.

The analysis is reported as an appendix first, because the data were not available until the body of the final report was almost completed, and secondly, because the work reported here is solely that of the authors listed below.

REPLICATION FACTOR ANALYSIS OF INTERACTION TAPES

by

Robert C. Burkhart and Melissa Winger

This verification study was based on 18 interaction tapes. The subjects were 4 spontaneous teachers and 4 divergent teachers each working with students of like and opposed strategies. Two tapes were made of each teacher-student interaction plus 2 additional tapes. A panel of 4 judges

evaluated 442 statements, 221 teacher statements and 221 student statements. Judges had been carefully trained; categories were discussed and agreed upon before judging began (see index of criteria). Probably for this reason, the judge reliability was high, the mean of the correlation of the 4 judges with the total at .827. (See Table XXIII)

Among the resulting 18 categories, the correlation matrix shows very few significant correlations. Because of these low intercorrelations, the factor anlysis is not accounting for large portions of the matrix variations, as was indicated by the communalities. The factor analysis (see Table XXIV) shows a relationship between teacher interest in student and student interest in himself, i.e. when the student is interested in himself, the teacher is also interested in him. Likewise, teacher task-centeredness relates directly to student teask-centeredness. Only these two categories, task-centeredness, factor 2, and interest in student, factor 3, are common to both teachers and students and they are highly interrelated. All remaining categories separate into factors characteristic of either teachers or students.

Factors 4 and 6 refer to newness, openness, and sustaining questions. Teachers cluster in factor 4; students, in factor 6. Thus they are independent and separate. In each case, however, newness, openness, and sustaining fall together and, therefore, must be similar. In factor 5, acceptance loads with emotionality for teacher statements; while for students, in factor 1, acceptance falls with repetition and footage. Similarly, repetition and footage load together for teacher statements suggesting that repetition and footage are interrelated for both teachers and students. Although emotionality falls with acceptance for teacher statements, it does not load with newness, openness, or sustaining categories as it does for students. This would indicate that teachers can be open, use new-entry

questions, and sustain the learning communication without being emotional. This is not the case for students as emotionality is associated with newness and openness for student statements.

Teacher responses factor analyzed alone fall into 3 factors, (see Table XXV) the first consisting of sustaining, openness, newness and interest in students; the second, of repetition and footage; and the third, of acceptance and emotionality.

INTERCORRELATIONS OF FACTOR VARIABLES FOR TEACHERS

factor 1

	sustaining	interest	newness
interest in student	163		
newness	.404	.055	
openness	.314	.214	.281

factor 2

	footage
repetition	.229

factor 3

	emotionality
acceptance	.229

Factor analysis of student responses indicates repetition, footage, and acceptance loading on one factor; interest in student and task-centeredness falling together on a second factor, but in a bipolar relationship suggesting that interest in the student is often negatively related to interest in the task; and newness, openness, emotionality, and sustaining making up a third factor. (See Table XXVI)

INTERCORRELATIONS OF FACTOR VARIABLES FOR STUDENTS

factor 1

	acceptance	footage
footage	.226	
repetition	.334	.502

factor 2

	interest in student
task-centeredness	.112

factor 3

	sustaining	emotionality	openness
emotionality	.325		
openness	.277	.303	
newness	.237	.229	.170

This replication justifies Jones' factor analyzing the teacher and student statements separately as they do not intercorrelate and are largely factorially independent. These two separate analyses replicate the total analysis and are very similar structure-wise.

Newness is associated with openness for both student responses and teacher responses and sustaining statements are related to new statements. In other words, those teachers who are making new statements are also making sustaining ones. Thus in Jones' system, teachers making sustaining and open statements are probably making new statements. This becomes theoretically important because it indicates that new entry type statements are related to sustaining statements, the two relating significantly and positively to one another. The teacher who utilizes new entry statements sustains responses even in situations where they have been instructed to do one and not the other, as was true on the tapes of this replication study.

The following is a comparison of Jones' factor loadings with those of the replication study:

FACTOR LOADINGS FOR TEACHER VERBAL BEHAVIOR

Jones' study		Replication study	
factor 1:	repetition length	factor 2:	repetition footage
factor 2:	rejection (acceptance) judging (emotionality)	factor 3:	acceptance emotionality
factor 3:	new open	factor 1:	newness openness sustaining interest in student

FACTOR LOADINGS FOR STUDENT VERBAL BEHAVIOR

factor 1:	repetition length new	factor 1:	repetition footage acceptance
factor 2:	open task	factor 2:	task-centeredness interest in student
factor 3:	rejection (acceptance) judging (emotionality)	factor 3:	sustaining emotional openness newness

Factor analysis shows the 9 categories for teacher statements closely parallel Jones'; however, factor analysis of the same categories for students does not replicate Jones'. Student behavior is evidently more variable from one population to another.

TABLE XXIII

INTER-RELIABILITY OF 4 JUDGMENTS
OF 8 TEACHER-CATEGORIES AND 8 STUDENT-CATEGORIES

variable number	variable name	judge 1	judge 2	judge 3	judge 4	average judgment
1	sustaining - t	.978	.953	.796	.902	.907
2	sustaining	.810	.786	.634	.759	.772
3	interest in student-t	.854	.672	.847	.847	.805
4	interest in student-s	.933	.809	.897	.620	.815
5	acceptance - t	.714	.683	.849	.756	.751
6	acceptance - s	.929	.907	.843	.935	.904
7	emotionality - t	.326	.869	.830	.913	.860
8	emotionality - s	.937	.937	.867	.987	.932
9	newness - t	.870	.929	.900	.946	.911
10	newness - s	.928	.916	.830	.545	.805
11	repetition - t	.742	.722	.866	.812	.786
12	repetition - s	.798	.844	.930	.906	.870
13	task-centeredness-t	.574	.686	.700	.624	.646
14	task-centeredness-s	.811	.948	.701	.573	.758
15	openness - t	.919	.853	.778	.853	.848
16	openness - s	.910	.894	.783	.874	.865
total						.827

*the tape footage (variables 17 and 18 in the factor analysis) needed no reliability check since footage is a measurement and not a judgment.

INDEX OF CRITERIA

1. Newness is a term intended to designate the relationship of the judged response to previous statements or ideas. A score of 3 indicates a statement in opposition or entirely apart from any formerly expressed idea, 2 describes a tangent response that has in some way grown from the preceding conversation, and 1 indicates repetition of an idea though stated in different terms.

2. Repetition refers to repetition of the same words or ideas within one statement or response. Such repetitions were counted and judged as 1, 2, and 3 or more repetitions.

3. Task Centeredness is a measure of the student-teacher's completion of the assigned purpose--"to evaluate the work and working procedure." 3 was given where there was evidence of direct reference to work or process; 2, where reference was made to the work with corresponding evaluative comments; and 1, where no reference was made to the task.

4. Openness expresses expectation of a variety of answers. If the statement was flexible leading to a wide variety of possible answers it was given a score of 3. A 2 described a more neutral statement and 1 indicated a closed statement which suggested its own answer, i.e., questions which could be answered only yes or no.

5. Acceptance. This criterion was designed to measure the response to a statement in terms of the degree to which the other's idea has been considered. Were the idea obviously considered, the statement was scored 3. 2 indicated only acknowledgment and 1, total ignorance.

6. Emotionality refers to tone as reflected in words and inflections, i.e., the degree of involvement. 3 would indicate strong emotional involvment; 2, partial involvement; and 1, no involvement.

7. Sustaining is a term which acts as a measurement of the concern for further clarification or further elaboration, often in the form of additional information. A judgment of 3 indicates a continuation or outgrowth of the idea, 2 refers to reitteration of the idea, and 1 designates ignorance of the idea.

8. Interest in Student as a measure concerns both the student's and teacher's interest in the student. Statements were judged as (a) interest in student - 3, (b) interest in teacher - 2, and (c) interest in product - 1.

TABLE XXIV

FACTOR ANALYSIS OF INTERRELATIONSHIPS
OF 18 CATEGORIES FOR TEACHERS AND STUDENTS

	variable number	factor loadings	variable name
FACTOR # 1	12	.847	repetition - st
	18	.768	footage - st
	6	.513	acceptance - st
FACTOR # 2	13	.897	task centeredness - te
	14	.872	task centeredness - st
FACTOR # 3	4	.864	interest in student - st
	3	.855	interest in student - te
FACTOR # 4	9	-.807	newness - te
	1	-.705	sustaining - te
	15	-.617	openness - te
FACTOR # 5	5	-.826	acceptance - te
	7	-.552	emotional - te
FACTOR # 6	10	.786	newness - st
	16	.575	openness - st
	2	.539	sustaining - st
	8	.529	emotional - st
FACTOR # 7	17	.805	footage - te
	11	.672	repetition - te

TABLE XXV

FACTOR ANALYSIS OF INTERRELATIONSHIPS
OF 9 CATEGORIES FOR TEACHERS

	variable number	factor loadings	variable name	
FACTOR # 1	1	.734	sustaining	
	8	.695	openness	
	5	.688	newness	
	2	.455	interest in student	
	7	.282	task centeredness	(not significant)
FACTOR # 2	6	-.718	repetition	
	9	-.703	footage	
FACTOR # 3	3	-.888	acceptance	
	4	-.510	emotionality	

TABLE XXVI

FACTOR ANALYSIS OF INTERRELATIONSHIPS
OF 9 CATEGORIES FOR STUDENTS

	variable number	factor loadings	variable name
FACTOR # 1	6	.773	repetition
	9	.736	footage
	3	.610	acceptance
FACTOR # 2	2	-.794	interest in student
	7	.627	task centeredness
FACTOR # 3	5	-.806	newness
	8	-.592	openness
	4	-.539	emotional
	1	-.520	sustaining